

Name _____ Date _____

What Makes You So Special?

Special Products

Vocabulary

Give an example of each term. Then, factor the expression.

1. perfect square trinomial
2. difference of two squares
3. sum of two cubes
4. difference of two cubes

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Problem Set

Factor each binomial completely.

- | | |
|--|----------------|
| 1. $x^2 - 25$
$x^2 - 25 = (x + 5)(x - 5)$ | 2. $x^3 - 64$ |
| 3. $x^3 + 27$ | 4. $m^2 - 100$ |

5. $5x^3 + 40$

6. $t^3 - 125$

7. $8a^3 - 27$

8. $x^8 - y^8$

Factor the trinomial completely.

9. $x^2 + 16x + 64$

$x^2 + 16x + 64 = (x + 8)(x + 8)$

10. $k^2 - 20k + 100$

11. $2x^2 - 28x + 98$

12. $5x^2 + 10x + 5$

13. $z^3 + 18z^2 + 81z$

14. $3x^3 - 30x^2 + 75x$

Determine the root(s) of each quadratic equation. Check your answer(s).

15. $x^2 - 100 = 0$

$x^2 - 100 = 0$

$(x + 10)(x - 10) = 0$

$x + 10 = 0$ or $x - 10 = 0$

$x = -10$ or $x = 10$

The roots are -10 and 10 .

Check:

$(-10)^2 - 100 \stackrel{?}{=} 0$

$100 - 100 \stackrel{?}{=} 0$

$0 = 0$

$(10)^2 - 100 \stackrel{?}{=} 0$

$100 - 100 \stackrel{?}{=} 0$

$0 = 0$

16. $m^2 - 16m + 64 = 0$

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17. $6x^2 + 24x + 24 = 0$

18. $4x^2 - 9 = 0$

19. $t^2 + 22t + 121 = 0$

20. $12w^2 - 48w + 48 = 0$

Determine the zero(s) of each quadratic function. Check your answer(s).

21. $f(x) = x^2 - 225$

$$f(x) = x^2 - 225$$

$$0 = x^2 - 225$$

$$0 = (x + 15)(x - 15)$$

$$x + 15 = 0 \quad \text{or} \quad x - 15 = 0$$

$$x = -15 \quad \text{or} \quad x = 15$$

The zeros are -15 and 15 .

Check:

$$(-15)^2 - 225 \stackrel{?}{=} 0$$

$$225 - 225 \stackrel{?}{=} 0$$

$$0 = 0$$

$$(15)^2 - 225 \stackrel{?}{=} 0$$

$$225 - 225 \stackrel{?}{=} 0$$

$$0 = 0$$

22. $f(x) = x^2 + x + \frac{1}{4}$

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23. $f(x) = 9x^2 - 1$

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24. $f(x) = 8x^2 - 48x + 72$

25. $f(x) = 8x^2 - 50$

26. $f(x) = 2x^2 + 52x + 338$